

The particularities of protein fraction in the apoptosis of lymphocytes of patients with Asthma

Vodounon C., Abramova Z., Aikou N., Sezan A., Kotchoni S., Akpona S., Baba-Moussa L.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The emergence of various diseases specifically severe diseases such as bronchial asthma is associated with apoptosis of lymphocytes. One of the major biochemical features of apoptosis is chromosome DNA fragmentation implemented by apoptotic nucleases. The inactivation of these apoptotic nucleases produces undigested DNA and is linked to a number of autoimmune disorders. Instead of this we have studied the enzymatic activities of the cytoplasmic and nucleic proteins of lymphocytes from healthy donors and patients with bronchial asthma. The study of enzymatic activities of the nuclease of lymphocytes was assessed by flow cytometry, spectrofluorimetry and electrophoresis method in agarose gel. In the peripheral blood cells of healthy donors undergoing apoptosis, we found a DNase activated by Ca^{2+} and Mg^{2+} ions. Lymphocytes of patients with bronchial asthma contain DNases, the activity of which depends on the seriousness of the disease. In patients cells, the activity of the Mn^{2+} -dependent DNase increases, whereas the activity of the Ca^{2+} , Mg^{2+} -dependent DNase decreases. Taking into consideration the role of the Ca^{2+} , Mg^{2+} -dependent DNase in apoptosis, we can propose that there is a link between the reduction of the rate of apoptosis of lymphocytes in patients with bronchial asthma and the dysfunction of the induction of "apoptotic" Ca^{2+} , Mg^{2+} -dependent nuclease. According to the results obtained, we can assume that why apoptosis of lymphocytes resist in patients with bronchial asthma is a reduction in concentration of endocellular calcium and an increase of manganese ions content, which results in the triggering of activation mechanism for Mn^{2+} -dependent endonuclease activity. This leads to the change of DNA fragmentation nature in lymphocytes and as a consequence, to disorders in process of apoptotic bodies' formation, thus, hindering apoptosis of lymphocytes in patients with bronchial asthma. © 2013 Asian Network for Scientific Information.

<http://dx.doi.org/10.3923/pjbs.2013.1873.1883>

Keywords

Apoptosis, DNA, Protein fraction